This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

Educ T
118
98.410

GAY'S PROBLEMS IN ARITHMETIC

BOOK II.

BENJ. H. SANBORN & CO.
— BOSTON, U.S.A. —

Digitized by Google

Educ T 118.95.410

PROPERTY OF THE
SCHOOL DISTRICT
OF THE
Town of Exeter, N. H.

THIS BOOK is loaned to the pupil on the following conditions:—

1. It is to be carefully used and not marked or defaced.
2. It is not to be taken from the school-room without the consent of the teacher.
3. If lost or injured it is to be paid for by the pupil using it.

COST, $..... No.....

LOANED TO	DATE.

HARVARD COLLEGE
LIBRARY

GIFT OF THE
GRADUATE SCHOOL
OF EDUCATION

Digitized by Google

3 2044 097 003 891

Digitized by Google

Digitized by Google

PROBLEMS IN ARITHMETIC

BY

GEORGE E. GAY

Superintendent of Schools, Malden, Mass.

BOOK II

FOR GRADE IV

οὐ πόλλ' ἀλλὰ πολύ.

BENJ. H. SANBORN & CO.
BOSTON, U. S. A.

Digitized by Google

Educ T 118.94.410 (2)

HARVARD COLLEGE LIBRARY
GIFT OF THE
GRADUATE SCHOOL OF EDUCATION
21 J 29

Copyright, 1898, by GEORGE E. GAY.

F. H. GILSON COMPANY
PRINTERS AND BOOKBINDERS
BOSTON, U. S. A.

Digitized by Google

PREFACE.

This book, like Book I of the Series, contains — without counting combinations — **one thousand problems.** Like those in Book I they are practical, comprehensive, simple, systematic, progressive. The first seven hundred and fifty are arranged in lessons of five problems each, and generally each problem in a lesson differs in character from every other problem in the lesson. The last two hundred and fifty problems are arranged in groups of twenty-five problems similar to one another, under ten titles. These are designed for use in giving emphasis to any kind of problems which prove especially difficult for a class.

A good method of instruction in arithmetic secures absolute accuracy in the various operations, leads the pupil to the discovery of the truths to be taught, and stimulates and strengthens the logical faculties. It makes every lesson its own reward for effort through the joy of victory over difficulty. No text-book can compel these qualities of instruction, but it is believed that this little volume will tend to provoke and develop them.

The problems presented in the following pages are generally very simple. Occasionally a few difficult problems are inserted as a challenge to the best pupils.

Teachers should be sure that every new term is made clear to the pupils when it first appears. Feet, inches, pounds, square feet, cubic inches, etc., should be as real to the child as chestnuts, strawberries, or slates; and they should be made real by the same means;

Digitized by Google

that is, by vigorous and long continued use of the senses. Every advance lesson should be carefully studied by the teacher before it is assigned, in order to see that the language of the book is clearly understood by all pupils, and that they are familiar with the processes required. After necessary instruction in terminology and processes, every pupil should be given an opportunity to solve all the problems without assistance of any kind. The pupil who "ciphers through the book" will acquire a good degree of mathematical ability. Reviews should be unremitting, especially oral reviews in which the pupils tell how they would solve the problems, with the reasons for their methods. If a pupil finds a problem too difficult, he should first solve a similar problem with smaller numbers. One or two questions will often lead a perplexed pupil to the light. In cases of absolute defeat, it is best to leave the problem unsolved till a later time. Interest in the work, secured by right methods of instruction, is the only stimulus needed in teaching arithmetic.

G. E. G.

Malden, Mass., September, 1898.

Digitized by Google

Chart No. 1.

A TABLE OF CONSTANTS.

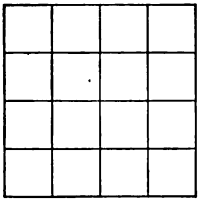
12 inches	= 1 foot.
144 square inches	= 1 square foot.
1728 cubic inches	= 1 cubic foot.
16 ounces	= 1 pound.
3 feet	= 1 yard.
9 square feet	= 1 square yard.
27 cubic feet	= 1 cubic yard.
196 pounds of flour	= 1 barrel.
12 units	= 1 dozen.
12 dozen	= 1 gross.
144 units	= 1 gross.
24 sheets of paper	= 1 quire.
4 gills	= 1 pint.
8 quarts	= 1 peck.
2 pints	= 1 quart.
4 pecks	= 1 bushel.
32 quarts	= 1 bushel.
4 quarts	= 1 gallon.
8 pints	= 1 gallon.
64 pints	= 1 bushel.

Digitized by Google

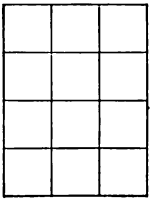
Chart No. 2.

AREAS.

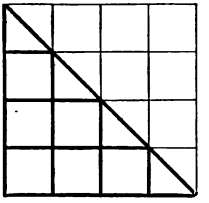
SQUARE.



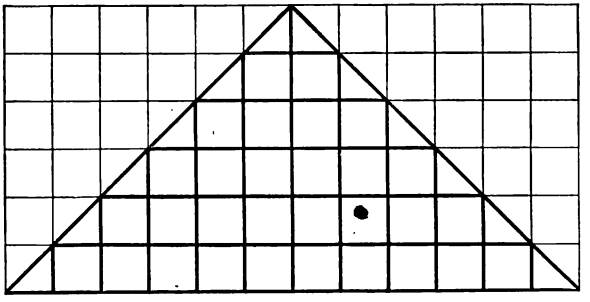
RECTANGLE.



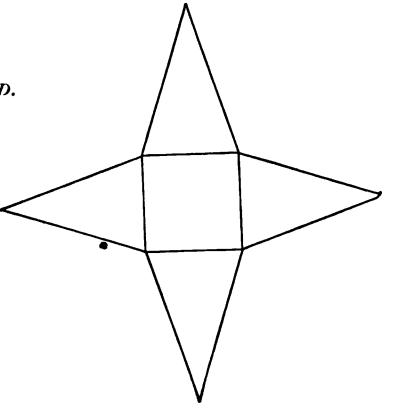
RIGHT TRIANGLE.

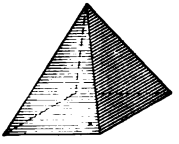


TRIANGLE.



SURFACE OF A SQUARE PYRAMID.





Digitized by Google

PROBLEMS IN ARITHMETIC.

BOOK II.

Lesson 1.

1. A man bought a horse for $236, a carriage for $140, a harness for $65, and a whip for $1.50. What did they all cost?

2. Having $396, I spent $201 for a house-lot. How much money did I have left?

3. If a farm containing 300 acres be divided into lots of 12 acres each, how many lots will there be?

4. If a township of 30,000 acres be divided into 10 equal farms, how many acres will there be in each farm?

5. What is the cost of 3962 barrels of flour at $6 per barrel?

Lesson 2.

1. James has 3962 dollars, and pays Charles 2463 dollars. How much money has James left?

2. America was discovered in A D. 1492; the Pilgrims landed at Plymouth in A.D. 1620. How many years from the discovery of America to the landing of the Pilgrims?

3. Find the cost of 6973 lbs. of butter at 25 cents a pound.

Digitized by Google

4. A trader deposited $625 in his bank on Monday, $396 on Tuesday, $497 on Wednesday, $600 on Thursday, $227.14 on Friday, $396.26 on Saturday. How much did he deposit during the entire week?

5. A carpenter earned $21 during a week. Counting 6 working days for the week, what was his average day's wages?

Lesson 3.

1. A and B start from the same town and travel in opposite directions. When A has gone 269 miles, B has gone 603 miles. How far apart are they?

2. The area of Massachusetts is 7800 square miles; the area of Texas is 274,336 square miles. How much larger is Texas than Massachusetts?

3. If $326.37 be divided equally among 13 people, how much will each person receive?

4. In 1 square mile are 640 acres. How many acres are there in 87 square miles?

5. There are 16 ounces in 1 pound. How many pounds are there in 32,096 ounces?

Lesson 4.

1. In a certain family the father earns $640 per year, one son earns $390, another son earns $490, one daughter earns $400, and another daughter earns $300. How much do they all earn?

2. What is the cost of 396 tons of hay at $16.25 per ton?

3. If 3962 bushels of wheat be divided equally among 13 persons, how much will each person receive?

4. The circumference of the earth is about 25,000 miles. If a man travels around it at an average rate of 7 miles an hour, how many hours will it take him to complete the circuit?

Digitized by Google

5. A man having $3962 in his bank drew out $1462.37. How much did he have left in the bank?

Lesson 5.

1. Find the cost of 362 yards of broadcloth at $7.50 per yard.

2. A man who had a farm of 396 acres divided it into 9 equal parts. How many acres were there in each part?

3. I bought a house for $3396, and paid $126 for having it painted, and $396 for changes. What was the total cost of the house?

4. A traveled 396 miles in a certain direction; B started from the same place at the same time and traveled 300 miles in the same direction. How far apart were they?

5. Henry had 87 marbles, and sold 39 of them. How many marbles had he left?

Lesson 6.

1. If the difference between two numbers is 309, and the larger is 896, what is the smaller number?

2. If the dividend is 3978, and the quotient is 306, what is the divisor?

3. If the product is 1728, and one factor is 144, what is the other factor?

4. If the subtrahend is 396, and the minuend is 962, what is the remainder?

5. If the sum of two numbers is 9863, and one of the numbers is 3462, what is the other number?

Lesson 7.

1. Having 387 miles to travel, I completed 262 the first week. How many miles remained for me to travel?

Digitized by Google

2. A postal clerk has 396 letters for Boston, 396 for New York, 1240 for Chicago, 209 for Washington, and 3627 for other places. How many letters has he in all?

3. What is one-twelfth of 396?

4. Find the cost of 396 yards of cloth at 26 cents a yard.

5. How many dozen in 8962 single things?

Lesson 8.

1. How many bushels in 397 pecks?

2. How many cents in 246 dollars?

3. How many minutes in 962 hours?

4. The Amazon River is 4000 miles long; the Mississippi is 3160 miles long. How much longer is the Amazon than the Mississippi?

5. The area of Maine is 35,040 square miles; New Hampshire, 9305; Massachusetts, 8315; Rhode Island, 1250; Vermont, 9565; Connecticut, 4990. What is the combined area of these states?

Lesson 9.

1. How many dollars in 300 dimes?

2. If you can buy 250 apples for a dollar, how many can you buy for 250 dollars?

3. If 3 square feet of land cost $1, what will 3986 square feet cost?

4. Mount Everest in Asia is 29,002 feet high; Mount Saint Elias in North America is 19,500 feet high. How much higher is Mount Everest than Mount Saint Elias?

5. In 1890 the four largest cities in New Hampshire, with their populations, were as follows: Manchester, 44,126; Nashua, 19,311; Concord, 17,004; Dover, 12,790. What was the total population of these four cities?

Digitized by Google

Lesson 10.

1. A bank discounted notes for the following sums: $3900, $2860.37, $2094, $1440, $209.62. Find the total.

2. The population of Providence, R. I., in 1890 was 132,146; in 1895 it was 145,472. What was the increase in the five years?

3. A grocer has 626 dozen eggs. How many eggs has he?

4. How many yards in 3962 feet?

5. If a farm is worth $3396, what is one-fifteenth of it worth?

Lesson 11.

1. I bought 396 gallons of oil and put it into quart bottles. How many bottles were required?

2. A flagstaff broke in a gale, 37 feet from the ground; the part broken off was 67 feet long. How long was the flag staff?

3. How many days in 146 years?

4. How many square inches in a right triangle whose three sides measure 15, 20, and 25 inches, respectively?

5. The area of Ireland is 32,481 square miles; the area of Spain is 192,959 square miles. How much larger is Spain than Ireland?

Lesson 12.

1. 1 man can do a piece of work in 36 days. How long will it take 9 men to do the same work?

2. John goes north 27 miles; James goes east from the same point 36 miles; they are then 45 miles apart. If three fences be built, one from where they started to John, one from John to James, one from James to the point of starting, how many square miles will be enclosed by the fences?

Digitized by Google

3. I put 11,544 eggs in boxes containing 1 dozen each. How many boxes did I require?

4. I paid $39.60 for a sofa, $15 for a rocker, $56 for a carpet, and $18.92 for a table. How much did I pay for all?

5. Find the difference between 39,624 and 89,623.

Lesson 13.

1. ? × 8 = 4984

2. 387 × ? = 2709

3. 496 × 9 = ?

4. 396 + ? = 986

5. 937 − ? = 836

6. 387 + 46 = ?

7. 896 − ? = 437

8. 862 − 246 = ?

9. ? + 387 = 596

Lesson 14.

1. If a quantity of food will last 306 soldiers 11 days, how long will it last 1 soldier?

2. If a quantity of food will last 1 soldier 30 days, how long will it last 10 soldiers?

3. A man sold a house for $8000, thereby gaining $1400. What did the house cost him?

4. A man bought a house for $5620, and sold it for $4987. How much did he lose?

5. If 396 apples be divided equally among 9 boys, how many will each boy receive?

Digitized by Google

Lesson 15.

1. I spent $396, and had $569 left. How much had I at first?

2. There were 76 pigeons in a flock, and a hunter shot 49. How many were left?

3. What is $\frac{1}{3}$ of 3962?

4. A room is 36 feet long and 28 feet wide. How many square feet in the floor?

5. A man paid $23 for a desk, $3.50 for a chair, $3.92 for stationery, and $6.40 for postage stamps. How much did he spend for all?

Lesson 16.

1. If I borrow $136.42, and pay back $87.33, how much do I still owe?

2. There are 396 pupils in a certain school, of whom 25 per cent. were tardy in the month of June. How many were tardy?

3. How many square feet in 37 square yards?

4. How many quarts in 3960 pints? How many pints in 3960 quarts?

5. Henry Owen owes his grocer $36.27; his butcher, $8.96; his milkman, $4.36, and his tailor, $21.42. How much money will he require to pay his bills?

Lesson 17.

1. 9) 846	4. 6) 4925	7. 5) 1427
?	?	?
2. ?) 1627	5. 5) ?	8. 4) ?
$203\frac{3}{8}$	$1462\frac{2}{5}$	$1936\frac{3}{4}$
3. 7) ?	6. ?) 12,986	9. ?) 12,784
$1862\frac{1}{7}$	$3246\frac{2}{4}$	$4261\frac{1}{3}$

Digitized by Google

Lesson 18.

1. If I pay a debt of $24.66 with 3 ten-dollar bills, how much money should I receive?

2. If eggs are sold at a cent apiece, how many dozen will be sold for $1.44?

3. Change to eighths 10, 12, 15.

4. The smaller of two numbers is 396, and the difference is 146. What is the larger number?

5. If $14.14 be divided among some school children so that each pupil gets 9 cents, how many children will receive some of the money?

Lesson 19.

1. I bought a farm for $3240, and sold it so as to gain 10 per cent. How much did I gain?

2. I spend $\frac{1}{8}$ of my salary for house rent. If my salary is $1600, what is my house rent?

3. How many times is $12 contained in $22,752.

4. Mr. Jones paid $3500 for a farm, $600 for stock, $150 for a horse, $75 for a carriage, $625 for furniture, and $176 for tools. How much did he expend in all?

5. The larger of two numbers is 396; the difference is 146. What is the smaller number?

Lesson 20.

1. I spent $3900 for a farm, which is 8 times as much as I paid for a house. How much did I pay for the house?

2. The minuend is 396: the remainder is 124. What is the subtrahend?

3. If $\frac{1}{8}$ of my money is $346, how much money have I?

Digitized by Google

4. From a bushel of apples I sell 13 quarts. How many quarts have I left?

5. I sold a horse for $193, thereby losing $47. How much did the horse cost me?

Lesson 21.

1. If 20 apples cost 40 cents, what do 37 apples cost?

2. What is the sum of $39.46, $27.32, $18, $162.87, $204.18, $395.49, and $300?

3. The sum of two numbers is 1480; one of the addends is 960. What is the other?

4. The product of two numbers is 18,099; one of the factors is 9. What is the other?

5. Find $\frac{1}{16}$ of 3842.

Lesson 22.

1. If 1 man can reap a field in 26 days, in how many days can 2 men reap the same field?

2. I owed a debt of $3960, and paid $1492. How much did I still owe?

3. The subtrahend is 9642, and the remainder is 3962. Find the minuend.

4. Find $\frac{3}{8}$ of 608.

5. I bought a hat for $3.50, a tie for $0.75, a pair of cuffs for $0.25, and paid for them with a ten-dollar note. How much change did I receive?

Lesson 23.

1. I have three children; to all three I gave presents at Christmas amounting to $13. To the oldest I gave presents worth $5.75; to the youngest I gave presents worth $3.96. How much did I give to the other child?

Digitized by Google

2. Find the number of square feet in the floor of a school-room that is 32 feet long and 28 feet wide.

3. I had 392 oranges; I sold $\frac{1}{2}$ to one man, and $\frac{1}{3}$ to another. How many did I have left?

4. James has \$39.42; Henry has \$14.36; Paul has as much as both James and Henry. How much money have all three?

5. If I divide 6270 dollars equally among 15 people, how many dollars will each person receive?

Lesson 24.

1. If my monthly gas bill is \$2.96, what is the cost of my gas for a year?

2. Sound travels 1142 feet in a second. How far will it travel in a minute?

3. In how many days will a man row 561 miles, if he rows 17 miles in a day?

4. If 3 men can build a wall in 5 days, in how many days will 5 men build the same wall?

5. If I receive \$50 a month and spend \$35, how much shall I save in a year?

Lesson 25.

1. A farmer sold 363 bushels of potatoes at 37 cents a bushel, and 201 bushels of oats at 42 cents a bushel. How much did he receive for both?

2. If I exchange 300 pounds of butter at 23 cents a pound, for cotton cloth at 8 cents a yard, how many yards of cloth shall I receive?

3. The product of three numbers is 4896; one factor is 16; another factor is 17. Find the third factor.

Digitized by Google

4. From a farm containing 846 acres there were sold at one time 246 acres, and at another 209 acres. How many acres remained?

5. Find the area of a rectangle 37 inches long and 29 inches wide.

Lesson 26.

1. How many days in 37 years, if 5 of them are leap years?

2. How many years from the settlement of Virginia, in 1607, to the Declaration of Independence, in 1776?

3. If there are 60 pieces of cloth in a bale, and 150 yards in each piece, how many yards are there in 16 bales?

4. Find the cost of 10 lbs. of sugar at 6 cents a pound, and 3 lbs. of coffee at 35 cents a pound.

5. A gentleman, on dying, left $10,000 to his family; to each of his 3 children he gave $2650, and the remainder to his wife. How much did he give his wife?

Lesson 27.

1. How many pints in 1 quart? How many quarts in 1 bushel? How many pints in 16 bushels?

2. If 3 men can mow a field in 4 days, in how many days can 4 men mow the same field?

3. If 3 men can build a wall in 4 days, how many men can build it in 1 day? How many days will it take 1 man to build it?

4. If 464 marbles are divided equally among 16 boys, how many marbles will each boy receive?

5. Find the sum of $360.27, $81.90, $31.40, $15.66, and $96.

Digitized by Google

Lesson 28.

1. I bought 320 acres of land of one man and 426 acres of another; afterward I sold 500 acres. How many acres had I left?

2. The distance from Boston to Worcester is 44 miles; there are 320 rods in 1 mile. How many rods is it from Boston to Worcester?

3. If a railroad train runs at the rate of 17 miles an hour, how many hours will it take for a journey of 85 miles?

4. 396 is one-tenth of what number?

5. If the product is 4815 and the multiplier is 15, what is the multiplicand?

Lesson 29.

1. I bought a hat for $3.75; I paid for it one silver dollar, two half-dollars, and the rest of the price in quarter-dollars. How many quarter-dollars did I pay out?

2. If 9 nuts cost 1 cent, how many nuts can I buy for a dollar?

3. If 1 boy can sweep the school-room in 30 minutes, how long will it take 3 boys to sweep it?

4. What number divided by 14 gives 326?

5. How many windows are there in your school-room? How many panes of glass are there in each window? How many panes of glass in all the windows?

Lesson 30.

1. I bought 320 bbls. of flour at $3.75 per barrel, and paid $21.45 for freight and drayage. What was the whole cost of the flour?

2. I sold a house for $3600, thereby gaining $1396. How much did the house cost me?

Digitized by Google

3. If a soldier receives $15 per month, how much money will be required to pay 896 soldiers for 3 months' service?

4. If 9 acres of land cost $927, what will 39 acres cost?

5. If an orange is worth 3 apples, how many apples will pay for 26 oranges?

Lesson 31.

1. My daily expenses for a week were as follows: Monday, $3.96; Tuesday, $2.16; Wednesday, $4.01; Thursday, $1.39; Friday, $2.96; Saturday, $5.67. What was my weekly expense bill?

2. An orchard contained 596 trees; 146 were apple trees, 206 were peach trees, the remainder were plum trees. How many were plum trees?

3. A merchant bought a lot of goods for $396.42, and sold them for $296.27. How much did he lose?

4. If the interest on 1 dollar for a year is $.04, what will be the interest on $31 for the same time?

5. If the interest on a sum of money for a year is $396, what is the interest on the same sum for 1 month?

Lesson 32.

1. How many minutes are there in 3 hours?

2. How many seconds are there in 15 minutes?

3. How many seconds are there in 3 hours?

4. 396 is one-ninth of what number?

5. John had 390 nuts and distributed them equally among 15 boys. How many nuts did each boy receive?

Lesson 33.

1. What is 25 per cent. of 12? 50 per cent. of 300?

2. What is 10 per cent. of 90? 75 per cent. of 16?

Digitized by Google

3. A man having 396 bushels of corn sold 25 per cent. of it. How many bushels did he have left?

4. I have a silver dollar, 3 "halves," 5 "quarters," and 4 dimes. How much money have I?

5. What is one-tenth of 8967?

Lesson 34.

1. I had $962.42 in the bank; I drew out at one time $240.40, and at another $162.43. How much did I have left in the bank?

2. John earned $27, and James earned $\frac{2}{3}$ as much. How much did both earn?

3. If 19 men earn $47.50 in a day, how much does each man earn?

4. In a certain school there were in one room 37 pupils, in another 49, in another 36, in another 42, in another 51. How many pupils were there in the school?

5. How many inches long is your desk? How wide is it? How many square inches are there in its surface?

Lesson 35.

1. How many square inches are there in a square foot?

2. If you draw a line from the upper right-hand corner of your desk to the left-hand lower corner, into how many parts have you divided the surface? What is the shape of each? How long is the longest side of each part? What is the number of square inches in each part? In both parts?

3. The sum of two numbers is 3965; one number is 2562. What is the other?

4. $3962 \div 18 = ?$

5. When silver is worth 53 cents an ounce, what are 25 lbs. worth?

Digitized by Google

Lesson 36.

1. 16) 596	4. 19) ?	7. 12) 446
?	436	?
2. 17) ?	5. 13) 897	8. 9) ?
24	?	427
3. ?) 8,694	6. ?) 10,752	9. ?) 5,886
621	896	654

Lesson 37.

1. Change to fourths, 13, 18, 16, 24.
2. How many gills are there in 6 quarts?
3. What is 75 per cent. of 72 horses?
4. How many weeks in 37 years?
5. How many inches long is your teacher's desk? How many inches wide is it? How many square inches are there in its top surface?

Lesson 38.

1. A certain house has 29 windows; 25 windows have 8 panes each, the other windows have 4 panes each. How many panes are there in the house?
2. A man is 63 years of age, and his wife is 15 years younger. How old is the wife?
3. After selling 209 sheep I have 426 left. How many had I at first?
4. I bought a bill of goods for $146; I paid $3.62 for freight. For how much must I sell the goods to make a clear gain of $22?
5. If the interest of a sum of money for one year is $14.50, what will be the interest on the same sum for five years?

Digitized by Google

Lesson 39.

1. I bought a bunch of beets for 15 cents, a head of cabbage for 10 cents, and 5 lbs. of beef at 12 cents a pound. What was the amount of my bill?

2. I buy coal at $5.25 per ton, and pay 25 cents a ton for putting it in. What do I pay for 5 tons?

3. How many windows are there in your school-house? How many panes in each window? How many panes in all?

4. I paid $62 for a watch, $17.50 for a chain, and $2.90 for a charm; I gave a hundred-dollar bill in payment. How much "change" did I receive?

5. Find one-fifteenth of 19,625.

Lesson 40.

1. How many pints in 396 gallons?

2. The greater of two numbers is 396; their difference is 201. What is the smaller number?

3. The sum of two numbers is 621; the smaller number is 149. What is the larger?

4. The factors are 24 and 396. What is the product?

5. The divisor is 27 and the quotient is 162. What is the dividend?

Lesson 41.

Arrange in columns and add:

1. Thirty-nine, four hundred one, one hundred twenty-nine, sixty-seven, thirteen.

2. Thirty-nine, forty-seven, sixty-three, three hundred forty-seven, twenty-nine.

3. Nine hundred fifty, six hundred forty, two hundred thirty-one, eight hundred one.

Digitized by Google

4. One hundred twenty-one, two hundred twenty-two, three hundred twenty-three, four hundred four.

5. One thousand twenty-six, nine hundred seventy-one, eight hundred forty-nine, twenty-six.

Lesson 42.

1. Of three numbers the second is 20 less than the third, and the first is 30 less than the second; the first is 67. What is the third?

2. If my salary is $1800 and I spend one-sixth of it for rent, what do I have left for other purposes?

3. Mr. Smith bought a lot of watches for $360, and sold them so as to gain 25 per cent. For how much did he sell them?

4. How many times is $18 contained in $360?

5. If $3600 be divided equally among 9 men, how much will each receive?

Lesson 43.

1. What are the factors of 4, 6, 8, 10?

2. What is the cost of a board 12 feet long and 1 foot wide, at 3 cents a square foot?

3. My house cost me $5000; I have paid 75 per cent. of it. How much do I still owe?

4. I bought a horse for $150, and sold him so as to gain 20 per cent. How much did I sell him for?

5. If you have 5 problems to perform, and do 20 per cent. of them, how many do you perform?

Lesson 44.

1. How many inches are there in a ruler that is 1 foot and 3 inches long?

2. $3962 \times 457 = ?$

Digitized by Google

3. If the divisor is 9, the quotient 5, and the remainder 5, what is the dividend?

4. What per cent. of a dollar is a dime? A "quarter"? A "half"?

5. How many inches is it from the top of your desk to the floor?

Lesson 45.

1. How many square inches in 2 square feet?

2. Draw a triangle whose sides are 3, 4, and 5 inches, respectively. What kind of a triangle is it? What is its area?

3. Draw a triangle whose sides are each twice as large as the sides of the other triangle. What kind of a triangle is it? What is its area?

4. Draw on the blackboard a triangle whose sides are three times as long as the sides of the triangle in problem 2. What kind of a triangle is it? What is its area?

5. How many times as great is the triangle in problem 3 as the triangle in problem 2? How many times as great is the triangle in problem 4 as the triangle in problem 2? If you made a triangle whose sides were four times as great as the sides of the triangle in problem 2, how many times as great do you think the triangle would be?

Lesson 46.

1. If I have 4 oranges, to how many boys can I give $\frac{1}{4}$ of an orange?

2. How many feet in 2 yards? 3 yards? 5 yards? 200 yards?

3. How many feet in 1 yard and 2 feet? In 3 yards and 1 foot?

4. Find the cost of 26 pounds of sugar at 7 cents a pound, and 2 pounds of tea at 80 cents a pound.

5. What is $\frac{1}{15}$ of 7440?

Digitized by Google

Lesson 47.

1. John received 3 dozen oranges at Christmas; he ate 2, gave away 15, and lost 3 through a hole in his overcoat pocket. How many had he left?

2. John has 36 marbles, Mary has 16 less than John, and Charles has just as many as John. How many have all three?

3. The sum of two numbers is 310; one number is 156. What is the other?

4. If 3 coats cost $135, what will 15 coats cost?

5. What are the factors of 15, 18, 9?

Lesson 48.

1. From 3962 take 2597.

2. What is the distance in inches around the edge of your desk?

3. How many inches in 2 feet? 5 feet? 2 feet and 6 inches?

4. There are 16 ounces in a pound. How many ounces in $\frac{1}{2}$ a pound? In $\frac{1}{4}$ a pound? In 1 pound and $\frac{1}{4}$ a pound?

5. If a paper boy saves 8 cents in a day, and works 300 days in a year, how much does he save in 3 years?

Lesson 49.

1. A certain school of 398 pupils marches out at recess in ranks of 4 pupils. How many ranks are there?

2. How many square inches in $\frac{1}{2}$ of a square foot? In $\frac{1}{4}$ of a square foot? In $\frac{1}{8}$ of a square foot?

3. John has $\frac{1}{2}$ of an apple; Mary has $\frac{1}{4}$ of an apple. How many fourths of an apple have they both?

4. What are the factors of 8? 4? 18?

5. How far will you walk in going 4 times around a square field that is 30 rods long?

Digitized by Google

Lesson 50.

1. I bought 8 ounces of butter for 15 cents. At this rate, what would a pound cost?

2. How many days are there in the spring months?

3. If my family use 25 per cent. of a barrel of flour in a month, how many months will a barrel last?

4. What is the cost of 2 dozen bananas at 2 cents each?

5. How many eighths of an orange could you get from one-fourth of an orange?

Lesson 51.

1. Write in figures and add: Three thousand two hundred forty-nine, nine hundred forty-two, eight hundred thirty-seven, ninety-three.

2. If James picks 120 apples in 30 minutes, how many can he pick in 25 minutes?

3. If a steamer travels 105 miles in 7 hours, how many miles will she travel in 5 days?

4. If 7 bushels of corn are worth $3.85, what are 27 bushels worth?

5. How many square rods in a square field 30 rods long and 30 rods wide?

Lesson 52.

1. How many must be added to 3962 to make 5627?

2. What are the factors of 21, 18, 15?

3. If the divisor is 26 and the dividend 3962, what is the quotient?

4. How many nines must be added together to make 54?

5. What is 25 per cent. of 39,496?

Digitized by Google

Lesson 53.

1. How many square inches in a square foot? Make a drawing to illustrate and prove your work. How many rows of squares have you? How many squares are in each row?

2. If I buy a horse for $3962, and sell him for $4000, how much do I gain?

3. Henry had 80 marbles; he gave $\frac{1}{2}$ of them to Frank, $\frac{1}{4}$ of them to Charles, and 19 to Mary. How many had he left?

4. How many square feet of plastering in the ceiling of your school-room?

5. Add $39.62, $481.27, $362.21, $10.10, and $25.

Lesson 54.

1. How many weeks are there in 396 years?

2. I bought a horse for $90, and sold him at a loss of 10 per cent. For how much did I sell him?

3. How many gills are there in 3 quarts?

4. How many ounces are there in 18 pounds?

5. What is $\frac{1}{24}$ of 962?

Lesson 55.

1. Change to sevenths, 21, 46, 29.

2. Change to twenty-fifths, 1, 2, 5.

3. The divisor is 16, the quotient is 7, and the remainder is 14. What is the dividend?

4. The remainder is 396, and the minuend is 526. What is the subtrahend?

5. What are the factors of 25, 28, 16?

Digitized by Google

Lesson 56.

1. 23) 5862	4. 29) 1896	7. 24) 14,444
?	?	?
2. 25) ?	5. 28) ?	8. 22) ?
1896	$1426\frac{11}{28}$	$1,111\frac{1}{22}$
3. ?) 8962	6. ?) 9126	9. ?) 18,816
$331\frac{25}{27}$	351	896

Lesson 57.

1. A man lived to be 89 years old; his oldest son died at 82; his wife lived to be 101. What is the sum of their ages?

2. Five boys are, respectively, 11, 12, 13, 12, 15 years old. What is their average age?

3. In a certain school the boys number 392; the girls outnumber the boys by 25. How many pupils in the school?

4. A merchant bought a case of dry goods for $396.25; he paid for express $1.75. For how much must he sell the goods to gain $27.50?

5. What is 10 per cent. of $3962?

Lesson 58.

1. If I pay a debt of $39.40 with 4 ten-dollar bills, how much shall I receive in "change"?

2. 10 houses on a certain street are just alike; each house has 21 windows, 17 of 8 panes each, 4 of 4 panes each. How many panes of glass in all the houses?

3. I paid $19.20 for rent, $14.50 for a coat, $3.50 for a pair of boots, $5.60 for pew rent. How much did I expend?

Digitized by Google

4. Change to eighths, 14, 24, 34.

5. How many square inches in a board that is 18 inches long and a foot wide?

Lesson 59.

1. What is the cost of 396 bbls. of flour at $4.75 per barrel?

2. If 3 men can reap a field in 2 days, how long will it take 4 men to reap the same field?

3. Two boys start to run from the school-house to the post-office; one of them can run 28 rods a minute, the other can run 30 rods a minute. How far apart will they be at the end of 8 minutes?

4. What are the factors of 18, 16, 14?

5. The product is 3900; the multiplier is 25. What is the multiplicand?

Lesson 60.

1. Change to eighths, 17, 14, 20.

2. How many gills are there in a gallon?

3. What will 36 brooms cost at $2.50 a dozen?

4. Divide 39,621 by 36.

5. How many square feet in three square yards? Draw a figure to illustrate and prove your work.

Lesson 61.

1. There are $16\frac{1}{2}$ feet in a rod. How many feet are there in 4 rods?

2. If fence pickets are 2 inches wide, and the space between pickets is just the width of a picket, how many pickets will be required for 2 rods of fence?

Digitized by Google

3.

?	396	462
× 36	× 39	× ?
424	?	4158

4. Find the factors of 9, 15, 25, 35.

5. How many pounds are there in 326 ounces of butter?

Lesson 62.

1. My ruler is 1 foot and 8 inches long. How many inches long is it?

2. If the interest of $1 for 1 year is $.06, what is the interest of $250 for 2 years?

3. A field is 200 rods long and 100 yards wide. How many square rods does it contain?

4. How many feet in 3 yards and 2 feet?

5. Change to halves, 14, 24, 34, 44.

Lesson 63.

1. How many feet in 3 rods?

2. How many inches in $\frac{1}{2}$ foot?

3. How many inches in 16 feet?

4. How many inches in a rod?

5. If $94,440 be divided equally among 48 men, how much will each receive?

Lesson 64.

1.

3962	2462	396
— 427	— ?	+ ?
?	1446	592

2. How many times is 45 contained in 3625?

3. Find the sum of $396.42, $184.27, $1927.27, and $2462.14.

Digitized by Google

4. If 11 acres of land cost $9260, what do 520 acres cost?

5. The sum of three numbers is 896; one number is 201, another is 100 larger. What is the third?

Lesson 65.

Write in figures and add:

1. Two hundred fourteen dollars and ninety cents, three hundred twenty-one dollars and forty-seven cents, five hundred thirty-one dollars, and six hundred forty-two dollars and one cent.

2. Six hundred forty-two dollars and seven cents, two hundred one dollars and one cent, forty-two dollars and forty-seven cents, and thirteen dollars.

3. Three thousand ninety-two, five hundred eighty-five, two thousand twenty-seven, and nine hundred forty-five.

4. Nine thousand four hundred twenty-seven, two thousand three hundred thirty-three, thirty-seven, and ninety-one.

5. Fifteen hundred, eighteen hundred, twenty-three hundred.

Lesson 66.

1. How many square inches in a board 3 feet long and fifteen inches wide?

2. What is the area of a right triangle whose shortest sides are 36 inches and 42 inches, respectively?

3. What is the difference in form between an inch and a square inch? Between a foot and a square foot?

4. A monument is 150 feet high. If a man can climb 6 inches at each step, how many steps will he take in ascending the monument?

Digitized by Google

5. A garrison of 80 men have food enough for full rations for 4 days. How long will it last if the men are put on half rations? How many days would it last 20 men on half rations?

Lesson 67.

1. A man paid $175 for a horse, which was 5 times as much as he paid for a cow. How much did he pay for both?

2. Jones and Harrison went into partnership; Jones put in $3000, and Harrison put in $1500 more. How much did both put in?

3. What part of 18 is 9? Of 30 is 10? Of 24 is 6? Of 60 is 12?

4. How many feet in 3 rods?

5. How many pupils are present in your school-room today? If each one solves 4 problems correctly, how many problems will all solve?

Lesson 68.

1. $39{,}624 \div 48 = ?$

2. The multiplicand is 3927; the multiplier is 396. What is the product?

3. The telephone was first used in 1877. How many years ago is that?

4. If I can row 4 miles in an hour, in what part of an hour can I row 1 mile? How many minutes will it take?

5. How many bricks, each 8 inches long and 4 inches wide, will it take to lay a hearth that is 48 inches long and 30 inches wide?

Lesson 69.

1. There are 836 pupils in a certain school; on a stormy day 25 per cent. were absent. How many were present?

Digitized by Google

2. I sold a horse for $306, thereby gaining $26. How much did the horse cost me?

3. A farmer raised in one year 206 bushels of wheat, 190 bushels of barley, 246 bushels of oats, and 144 bushels of buckwheat. How much grain did he raise?

4. $\frac{1}{10}$ of my money is $39. How much have I?

5. Find the factors of 14, 16, 18, 20.

Lesson 70.

1. From a bushel of corn I sell 8 pints. How many quarts have I left?

2. From a quart of milk I sell 3 gills. How many gills have I left?

3. How many gills in 1 pint? In 3 pints? In 1 quart?

4. If I work 8 hours a day for 360 days, how many hours do I work?

5. On January 1, 1898, Carl had $326.25 in the savings bank; he put in $1.25 a week for 31 weeks. How much money did he have then in the bank?

Lesson 71.

1. Find $\frac{1}{17}$ of 1396.

2. Two trains start from Buffalo; one goes north 200 miles; one goes south 146 miles. How far apart are they?

3. How many pecks are there in 48 pints of nuts?

4. How many inches in 1 yard?

5. I bought a house for $3962 and sold it for $3521. How much did I lose?

Lesson 72.

1. If I pay $3 each for sheep, how many can I buy for $210?

Digitized by Google

2. If $\frac{1}{5}$ of the distance across a field is 20 rods, how wide is the field?

3. Find the cost of a bushel of blueberries at 6 cents a pint.

4. What are the factors of 25? 27? 30?

5. How many square inches in a slate 10 inches long and 8 inches wide?

Lesson 73.

1. Make a drawing to illustrate a square yard. How many square feet in 10 square yards?

2. If a board is a foot wide and 16 feet long, how many square feet does it contain?

3. What is the cost of 3 pounds of gold at $8 an ounce?

4. How many feet and how many inches in $\frac{1}{2}$ a rod?

5. Make a line 1 rod long on the school-room floor. How many books 6 inches long could be laid on your line, end to end?

Lesson 74.

1. Four men own houses on the same street. From A's to B's is 10 rods; from B's to C's is 15 rods; from C's to D's is 30 rods. How far is it from A's to D's?

2. If 9 lbs. of sugar cost 53 cents, what do 37 lbs. cost?

3. What is 37 times 901?

4. $\frac{396}{41} = ?$ $\frac{462}{11} = ?$

5. 396 is $\frac{1}{20}$ of what?

Lesson 75.

1. Find the cost of 87 chests of tea, each containing 49 lbs., at 63 cents a pound.

2. How many weeks in 365 days?

Digitized by Google

3. Find the cost of 81 yards of cloth at $1.25 a yard, 27 yards at $2.42, and 242 yards at 18 cents.

4. What is $\frac{1}{49}$ of 3627?

5. How many pupils' chairs are there in your room? How many screws fasten each chair to the floor? How many screws in the room are used for this purpose?

Lesson 76.

1. How many 1-inch cubes can you lay on a square foot? How many rows are there? How many cubes in each row? Call the 144 cubes a layer; put another layer on top of the first. How many cubes in the second layer? How many layers would make a cubic foot? How many cubic inches in one cubic foot?

2. How many bushels of wheat at 70 cents a bushel will pay for 10 tons of coal at $4.75 a ton?

3. What is $\frac{1}{7}$ of 962?

4. 3962 is one-seventh of what?

5. How many quarts in 2 bushels?

Lesson 77.

1. Find the cost of 30 feet of rubber hose at 2 cents an inch.

2. A woman carried to the store 3 doz. eggs worth 14 cents a dozen, and 10 lbs. of butter worth 22 cents a pound; she got in exchange 10 lbs. of sugar at $6\frac{1}{2}$ cents a pound, and the rest in money. How much money did she receive?

3. How many inches in a rod?

4. If 30 sheep cost $150, what do 75 sheep cost?

5. $(362 - 296) \times 31 = ?$

Digitized by Google

Lesson 78.

1. Divide 39,627 by 47.

2. Add 3962, 5432, and 3962.

3. Find the difference between 3962 and 3899.

4. The dividend was 3962 and the divisor was 49. What was the quotient?

5. How many screws are there in the iron support of your school chair? How many in all the supports in the room?

Lesson 79.

1. I bought a horse for $75, a harness for $27, a carriage for $62.50, and a lap robe for $3.75; I gave in payment a draft for $200. How much money did I receive in exchange?

2. The sum of two numbers is 13,962; one of the numbers is 4296. What is the other?

3. The multiplicand was 3962; the multiplier was 186. What was the product?

4. There are 196 pounds of flour in a barrel. If a grocer buys a barrel for $5, and sells it at 4 cents a pound, how much does he make?

5. A man works 8 hours a day, 6 days in the week, for 10 weeks, at 25 cents an hour. How much does he receive?

Lesson 80.

1. If 290 gallons of water run into a cistern in a day, and 256 are drawn out, in how many days will there be an increase of 1394 gallons in the tank?

2. If James can bring in the wood for his mother in 15 minutes, how long will it take him with 2 boys to help him?

Digitized by Google

3. If I can walk a mile in 15 minutes, how many hours will it take me to walk 32 miles?

4. How many feet in 2 rods? How many inches?

5. How many screws are used in fastening your desk to the floor? How many are used for this purpose in the room?

Lesson 81.

1. I sold a field for $980; with the money I bought a horse for $100, a yoke of oxen for $125, and a saddle for $60. How much did I have left?

2. Find the factors of 36, 27, 30.

3. How many quarters of an inch are there in a foot?

4. How many halves of an inch are there in a yard?

5. I bought a farm for $3600 and sold it so as to gain 25 per cent.? How much did I sell it for?

Lesson 82.

1. How many square feet in an oblong plot of ground 5 yards long and 3 yards wide?

2. If I can buy 16 pounds of sugar for $1, how many can I buy for $5?

3. If 2 oranges are worth 4 apples, how many oranges are worth 12 apples?

4. How many square inches in an oblong 2 feet long and $1\frac{1}{2}$ feet wide?

5. Find the number of cubic inches in a square prism 2 inches by 2 inches by 4 inches.

Lesson 83.

1. What of these numbers are divisible by 2, what ones by 5, and what by 10? 20, 24, 30, 35, 114, 162, 200.

2. How many feet are there in 2 rods? How many inches?

Digitized by Google

3. $\frac{1}{3}$ of 969 are how many more than $\frac{1}{5}$ of 1025?

4. Add $\frac{1}{8}$ of 3960 and $\frac{1}{2}$ of 1420.

5. Subtract one-twenty-seventh of 4860 from one-fifth of 1000.

Lesson 84.

1. What is 75 per cent. of 396?

2. Find $\frac{3}{4}$ of $320.

3. I bought 37 yards of silk at $3.47 a yard; I gave in payment 1 one-hundred-dollar bill and 3 ten-dollar bills. Ought I to pay more, or to receive "change," and how much?

4. How many lines are there on this page of your book? How many on 27 such pages?

5. I bought a house for $1500, and sold it so as to gain 10 per cent. For how much did I sell it?

Lesson 85.

1. How many problems are there on the first 5 pages of your book? At that rate, how many would there be on 50 pages?

2. If it takes you 15 minutes to solve the problems in 1 lesson, how many hours will it take you to solve the first 100 problems of this book?

3. At 5 cents an ounce, what will 5 pounds of spruce gum cost?

4. James did 75 per cent. of the problems in the first 60 lessons of this book correctly without assistance. How many did he fail to do correctly?

5. Find the sum of $39.05, $46.01, $18.96, $0.37, $0.10, $4.77, and $37.42.

Digitized by Google

Lesson 86.

1. Find the factors of 38, 26, 34, 46.

2. Add five thousand nine hundred sixty-two, thirty-seven thousand, nine hundred seventy-eight, ten thousand thirty-seven, and one thousand one.

3. A man purchased 3 plows at $6 each, 5 forks at 75 cents each, 10 hoes at $0.62 each, and a grindstone for $8.75. How much did he pay for all?

4. If 4 men can reap a field in 2 days, how long will it take 8 men to do the same?

5. The remainder is 246, the subtrahend is 590. What is the minuend?

Lesson 87.

1. Henry Horne sold to James Smith 500 cords of wood at $6.50 a cord, 3000 feet of boards at $15 per thousand, and 260 thousand of shirgles at $1.50 per thousand. What was the amount of the bill?

2. James is 39 years old; Charles is 43. Which was born first, and how many years before the other?

3. How many square inches in 30 square feet?

4. How many squares half an inch long and wide can you make in a square that is 3 inches on each side?

5. What are the factors of 16, 15, 14, 12?

Lesson 88.

1. The earnings of 4 men in a year are $2850. What is the average amount earned by each?

2. How many yards of cloth in 10 bales, each bale containing 40 pieces, and each piece containing 75 yards?

3. I paid $25 for a harness, $100 for a carriage, and for a horse as much as for the harness and carriage together. How much did I pay for all three?

Digitized by Google

4. How many feet in 5 yards and 2 feet?

5. With your ruler find the size of the glass used in the windows of your school-room, and compute the number of square inches of glass in one window. How would you change your square inches to square feet?

Lesson 89.

1. I bought 25 acres of land at $150 per acre; I built a house for $3900 and a barn for $700. How much did all cost me?

2. From three hundred eighty-seven thousand eight hundred ninety-two take two hundred fifteen thousand seventy-five.

3. My beet-bed is 5 yards long and 2 yards wide. How many square feet does it contain?

4. An apple-woman had 375 apples; she sold 100 at the rate of 2 for a cent, 150 at the rate of 3 for a cent, and gave away the rest. How much did she get for her apples?

5. In 3962 ounces how many pounds are there?

Lesson 90.

1. A student had $250 with which to furnish his room; he paid $25 for a carpet, $50 for a chamber set, $15 for a bookcase, $20 for bedding, $15 for a lounge, and $15 for a study table. How much money had he left?

2. A man willed $47,120 in equal parts to 38 benevolent societies. How much did each receive?

3. The product is 114,436; one factor is 61. What is the other?

4. What is the cost of a gallon of vinegar at 5 cents a pint?

Digitized by Google

5. A dealer bought 10 pounds of candy at 15 cents a pound, and sold it at 2 cents an ounce. How much did he make?

Lesson 91.

1. Find the factors of 16, 18, 20, 22.

2. How many fourths of an inch are there in 2 feet?

3. Mark out a square 2 inches on each side. How many squares $\frac{1}{4}$ of an inch on each side can you draw on the square? How many rows are there? How many squares are there in each row?

4. If the minuend is 3960, and the subtrahend is 2440, what is the remainder?

5. The salary of a cabinet officer is $8000 per year. If he expends $6250 each year, how much can he save in 4 years?

Lesson 92.

1. Find 3 fourths of 36.

2. What is one-sixtieth of 3900?

3. I sold a horse so as to gain 50 per cent. If he cost me $125, what did I get for him?

4. The difference between two numbers is 896; the larger is 2046. What is the smaller?

5. Henry Armand had $246.27 on deposit in his bank on Monday morning; during the day he deposited $101.42; on Tuesday he deposited $37, and drew out $91.42; on Wednesday he deposited $89.42, and drew out $105; on Thursday he drew out $50; on Friday he deposited $146; on Saturday he deposited $101.42, and drew out $90.44. How much remained to his credit at the end of the week?

Digitized by Google

Lesson 93.

1. How many 1-inch cubes in a rectangular prism that is 4 inches long, 2 inches wide, and 3 inches high?

2. If I buy ribbon at 10 cents a yard, and sell it at 5 cents a foot, how much do I gain on 5 yards?

3. The Eastern Empire fell in A.D. 1453; the Western Empire came to an end in A.D. 476. How many years between the events?

4. Julius Cæsar is said to have visited England 55 years before Christ. How many years ago was that?

5. If the divisor is 55, and the dividend is 9624, what is the quotient?

Lesson 94.

1. A barrel of sugar contained 240 pounds, and cost the grocer $14.40. If he sells it for 7 cents a pound, how much does he make?

2. How many square inches in a square 2 feet on each side?

3. Copy and fill the blanks:—

5 pecks = —— pints.
3 bushels = —— quarts.
9 gallons = —— pints.

4. What is the area of a right triangle whose short sides are 16 and 18 inches each?

5. My garden is 10 rods long, and 5 rods wide. How much will it cost for wire to fence it with 3 strands of wire at the rate of 2 feet for 1 cent?

Lesson 95.

1. In an orchard are 3960 trees; 1600 are apple trees, 1200 are peach trees, 1000 are pear trees, and the rest are quince trees. How many quince trees are there?

Digitized by Google

2. Fanny's mother paid her 5 cents each for hemming handkerchiefs. When she had hemmed 40, how many dollars had she earned?

3. Flour is sold in bags containing $\frac{1}{8}$ of a barrel. How many pounds are there in each bag?

4. How many inches are there in 2 yards?

5. How many inches are there in a rod?

Lesson 96.

1. How many gills are there in a quart?

2. How many inches are there in 10 feet 7 inches?

3. How many feet are there in 75 inches?

4. How many pounds are there in 300 ounces?

5. What will a dealer get for 10 quarts of milk at 5 cents a pint?

Lesson 97.

1. From a dollar I spent 3 dimes, a "quarter," and a "nickel." How much had I left?

2. What is 10 per cent. of \$3964? 25 per cent.? 75 per cent.?

3. Find 3 ninths of 36.

4. Two fields cost \$396.42; one cost \$147.21. How much did the other cost?

5. The divisor is 57; the quotient is $1962\frac{27}{57}$. What is the dividend?

Lesson 98.

1. How many pages are in this book? If there are, on the average, 13 problems on a page, how many problems are there?

2. What number multiplied by 39 gives 846?

Digitized by Google

3. How many minutes are there in $\frac{1}{2}$ a day?

4. If a pound of cheese cost 24 cents, what will a pound and a half cost?

5. How many gallons are there in 320 gills?

Lesson 99.

1. $37 \overline{)\,896}$?

2. $47 \overline{)\,?}$ $454\frac{2}{4}\frac{3}{7}$

3. $? \overline{)\,8962}$ $157\frac{1}{5}\frac{3}{7}$

4. $\begin{array}{r} ? \\ \times\ 67 \\ \hline 6663 \end{array}$

5. $\begin{array}{r} 146 \\ \times\ ? \\ \hline 8906 \end{array}$

6. $\begin{array}{r} 1624 \\ \times\ 69 \\ \hline ? \end{array}$

7. $\begin{array}{r} 3962 \\ -\ ? \\ \hline 1444 \end{array}$

8. $\begin{array}{r} 8624 \\ -\ 246 \\ \hline ? \end{array}$

9. $\begin{array}{r} ? \\ -4962 \\ \hline 11{,}111 \end{array}$

Lesson 100.

1. What is one thirty-ninth of 3962?

2. How many square feet in 10 square yards?

3. How many cubic feet in a cubic yard?

4. If I can buy 16 pounds of sugar for a dollar, how many pounds can I buy for $15?

5. Divide 3962 by 75.

Lesson 101.

1. 67 sailors share equally $6240 in prize money. How much does each receive?

2. Add $\frac{2}{3}$ of 393 to $\frac{3}{4}$ of 876.

3. What will it cost to pave a sidewalk 4 rods long and 8 feet wide at 5 cents a square foot?

4. What part of 10 is 5? Of 15 is 5? Of 90 is 45? Of 4 is 3?

5. What are the factors of 9? 18? 27? 36?

Digitized by Google

Lesson 102.

1. Multiply 3.2 by 4.8.

2. What will 6.2 pounds of butter cost at 23.5 cents a pound.

3. $(37 + 49) \div 14 = ?$

4. Find the cost of $26\frac{1}{2}$ pounds of sugar at 6 cents a pound.

5. Add 3.5, 7.6, 9.2, 3.1, and 14.

Lesson 103.

1. Add \$3.5, \$2.6, \$27.5, \$39.1.

2. Divide 62.5 by 2.5.

3. Find $\frac{3}{4}$ of 396.

4. The subtrahend is 3942, and the minuend is 8961. Find the remainder.

5. If every pupil in your room owns two pairs of mittens, how many mittens have all the pupils?

Lesson 104.

1. What are the factors of 54? 39? 45?

2. Which of the following numbers are divisible by 2, which by 5, and which by 10? 15, 20, 25, 30, 35, 40, 100, 142, 148, 150.

3. If the interest of \$50 for 1 year is \$3, what is the interest of \$1 for 1 year?

4. If the interest of \$625 for 1 year is 37.50, what will be the interest of the same sum for 1 month?

5. If the interest of a certain sum of money is \$24 for 1 year, what will be the interest of the same sum for 2 months?

Digitized by Google

Lesson 105.

1. $(326 + 42 - 191) \times 32 = ?$
2. Dividend, 39,624; divisor, 192. Find the quotient.
3. Divisor, 37; quotient, $396\frac{18}{37}$. Find the dividend.
4. Find what ones of these numbers are divisible by 10, by 5, and by 2: 18, 180, 1800, 5, 50, 500, 7, 14, 28, 56.
5. How many pictures are on the walls of your schoolroom? If there is an equal number in all the rooms of the building, how many pictures are there in the building?

Lesson 106.

1. Add 3.6, 9.3, 14, and 37.1.
2. Multiply 38.1 by 16.2.
3. How many cubic inches in a cube that is 4 inches in each dimension? How many cubes in each row? How many rows in each layer? How many cubes in each layer? How many layers? How many cubes in all?
4. If 2 men can do a piece of work in 7 days, how many days will it take 5 men to do the same?
5. If you can buy 20 marbles for a "nickel," how many can you buy for a "quarter" (5 "nickels")?

Lesson 107.

1. If I buy 30 lbs. cheese at 8 cents a pound, 15 lbs. butter at 26 cents a pound, and 50 lbs. sugar at $6\frac{1}{2}$ cents a pound, and pay for them with a 10-dollar bill, how much "change" shall I receive?
2. How many square rods are there in an oblong field 90 rods long and 62 rods wide?

Digitized by Google

3. I bought a house-lot at the corner of two streets, which had the shape of a right triangle, at 35 cents a square foot; the length on one street was 100 feet, on the other street was 60 feet, and from one street to the other was 80 feet. How much did the lot cost me? (Make a diagram for this and all similar problems.)

4. If the sum is 896, and one addend is 542, what is the other?

5. If the multiplicand is 900 and the multiplier is 90, what is the product?

Lesson 108.

1. If 96 acres of land cost $9600, what will 370 acres cost?

2. If you can buy 16½ pounds of sugar for $1, how many pounds can you buy for $9?

3. If you can buy 20 eggs for a "quarter," how many can you buy for $1.50? (How many "quarters"?)

4. What will 9.2 lbs. sugar cost at 6.5 cents a pound?

5. Find the factors of 32, 18, 24, 16, 6.

Lesson 109.

1. How many square feet are there in 3 square yards?

2. How many feet in 6 rods?

3. If it is 200 rods from your house to the school-house, and you can run 400 feet in a minute, how many minutes will it take you to run to school?

4. How many feet are there in 392 inches?

5. How many squares ½ an inch on each side can you make in an oblong 2 inches wide and 3 inches long? (Count squares in a row, and number of rows.)

Digitized by Google

Lesson 110.

1. How many pounds are there in 960 ounces?
2. How many ounces are there in 960 pounds?
3. What is $\frac{1}{3\,5}$ of 3962?
4. $(37 - 42 + 14) \div 8 = ?$
5. What are the *prime* factors of 30?

Lesson 111.

1. Find the number of cubic inches in a square prism measuring 5 inches by 4 inches by 4 inches?

2. What is the number of square inches in a right triangle that is 45 inches on one side, 60 on another, and 75 on another?

3. Draw a triangle that is 5 inches on one side, 5 inches on another, and 8 inches on the other. From the middle of the longest side draw a line to the opposite angle. Measure the line you have just made. (It will be just 3 inches.)

4. Into what kind of triangles have you divided the first triangle? What is the area of one of the smaller triangles? What is the area of the other? What is the area of the large triangle? The line which you drew is called the *altitude* of the triangle. The line from which you drew it is called the *base*.

5. Make another triangle whose sides are 5 inches, 5 inches, and 6 inches. Find its area. (Take the side that is 6 inches for the base.)

Lesson 112.

1. What is the number of square inches in a right triangle whose two sides at the right angle are 5 inches and 6 inches?

Digitized by Google

2. What is the area of a right triangle whose two short sides are 7 inches and 4 inches?

3. Find, by measuring, the length of the long side of each of these triangles.

4. Draw a right triangle whose long side is 5 inches, and one of whose short sides is 3 inches. What is the length of the other short side? (The short sides of a right triangle are called *legs*.)

5. The legs of a right triangle are $1\frac{1}{2}$ inches and 2 inches, respectively. Find, by measuring, the length of the long side.

Lesson 113.

1. Draw a triangle whose sides are 3, 4, and 5 inches. Is it a right triangle? Can you divide it into two right triangles?

2. Draw a triangle whose sides are 4, 5, and 6 inches, respectively. (The teacher will show you how to do this by cutting three pieces of string, or sticks, or pieces of paper, of the right length, and marking the points for the *angles* [corners].)

3. Cut off the corner of a sheet of paper. What kind of a triangle is it? Lay this on your triangle so that one short edge will lie upon the longest side, and the other short edge will pass through the angle opposite. Draw a line along the edge of your paper triangle from the long side to the opposite angle. Measure this line. (Parts of an inch should be estimated and expressed in tenths.)

Lessons 113–115 may be omitted in backward classes, and by teachers who prefer to hold till a later year the consideration of geometrical concepts. There is no special difficulty, however, in these lessons, if they are taken slowly and thoroughly. They can not be taught to average classes in the same time as the other lessons, which are designed as daily tasks. Before teaching a lesson, the teacher should carefully examine it, and decide just what and how much assistance she ought to give to the brightest pupil. This assistance should be given to the whole class, and then all pupils should have an opportunity to do their best. Afterward proper assistance may be given by the teacher, or by the brighter pupils, to those who require more help. The method of solution here prescribed calls for the estimation of tenths of an inch. A special exercise in this should precede the solution of the problems. Facility in this kind of work is easily acquired by teacher and pupil, and very useful. The teacher should not be surprised if the children excel her in accuracy. Give several exercises in dividing inches marked on paper into tenths, and in estimating parts of an inch in tenths.

Digitized by Google

4. Into how many triangles have you divided the large triangle? What kind of triangles are the small triangles? Can you find their area? How can you find the area of the large triangle?

5. Find the area of the large triangle by adding the areas of the two smaller ones.

Lesson 114.

1. Taking the same triangle as before, and using the same triangular paper, lay one short edge on the shortest side of the triangle, and draw a line to the opposite angle as before. What is the length of this line?

2. Find the area of the two right triangles, and of the whole triangle.

3. Taking the same triangle, lay a short edge of the paper triangle on another side of the large triangle, and draw a line as before. What is the length of this line?

4. Find the area of each small triangle, and of the large triangle.

5. The line which you have drawn is called, in each case, the *altitude*, and the side from which an altitude is drawn is called a *base*. How many altitudes does every triangle have? How many bases?

Lesson 115.

1. Find the area of a triangle whose sides are each 4 inches long.

2. Find the area of a triangle whose sides are 5 inches, 6 inches, and 7 inches, respectively.

3. How can you find the area of the whole triangle without first finding the area of the two small triangles made by the altitude?

Digitized by Google

4. If the base of a triangle is 10 inches, and the altitude is 6 inches, what is its area?

5. If the base of a triangle is 12 inches, and the altitude is $10\frac{1}{2}$ inches, what is the area?

Lesson 116.

1. Find the cost of three fields, one of 75 acres, one of 36 acres, and one of 90 acres, at \$21.75 per acre.

2. If 9 cows cost \$875.70, what will 42 cows cost at the same rate?

3. Harry set his hen on 12 eggs; 75 per cent of them hatched. How many chickens did he have?

4. How many feet are there in 309 yards?

5. How many square inches are there in 5 square feet?

Lesson 117.

1. Find the prime factors of 16, 18, 21.

2. How many feet are there in 900 inches?

3. How many inches are there in 90 feet?

4. How many feet are there in 10 rods?

5. How many rods are there in 66 feet.

Lesson 118.

1. How many square feet are there in a triangle whose base is 10 feet, and whose altitude is 8 feet?

2. How many square rods in a rectangular field 200 rods by 150 rods.

3. How many ounces in 26 pounds?

4. How many pounds in 300 ounces?

5. How many square inches in 5 square feet?

Digitized by Google

Lesson 119.

1. Find the cost of a triangular field whose base is 37 rods, and whose altitude is 26 rods, at $25 per square rod.

2. Find the cost of 20 pounds of honey at 2 cents an ounce.

3. Find the cost of 960 ounces of butter at 30 cents a pound.

4. The factors are 35 and 426. Find the product.

5. The divisor is 36; the quotient is 97. Find the dividend.

Lesson 120.

1. Find the cost of 10 square yards of land at $1 a square foot.

2. Find the number of cubic inches in a square prism 3 inches square at each end, and 9 inches long.

3. Multiply 9.6 by 17.4.

4. The dividend is $13.50; the divisor is $4.50. What is the quotient?

5. How many square inches are there in the smallest sheet of drawing paper which you use?

Lesson 121.

1. Find the area of a right triangle whose legs are 10 inches and 12 inches, respectively.

2. If the interest of 1 dollar for 1 year is 6 cents, what will be the interest of $540 for 2 years?

3. If the interest of 1 dollar for 1 year is $0.07, what is the interest of $1200 for 1 month?

4. $(627 \div 3) + 9 = ?$

5. $\frac{9627}{42} = ?$

Digitized by Google

Lesson 122.

1. Find the altitude and area of a triangle whose three sides are 6, 7, and 9 inches, respectively.

2. Prove your work of the last problem by using a different side for a base.

3. Give five numbers that are divisible by 2; three that are divisible by 5, and 2 that are divisible by 10.

4. Give two numbers divisible by 2 that are not divisible by 5; three divisible by 5 that are not divisible by 10; one divisible by 10 that is not divisible by 5.

5. Give a problem that contains these numbers, and solve it: 5, 15, 25.

Lesson 123.

1. $(13 - 6 + 4 + 144) \times 662 = ?$

2. If I buy 5 bushels of peas at 10 cents a quart, what do they cost me?

3. When milk is 5 cents a quart, how many gallons can I buy for one dollar?

4. How many square inches are there in the surface of the paper on which you are writing?

5. How many whole oranges in 35 halves? How many whole apples in 90 quarters? How many eighths of an orange in 30 quarters?

Lesson 124.

1. If you had $\frac{1}{2}$ of an apple, and John should give you $\frac{1}{4}$ of an apple, how many fourths would you have then?

2. If you can buy 3 pens for a cent, how many can you buy for a dollar?

3. What is 25 per cent. of 20 apples? Of 32 boys? Of 64 cents? Of 100 boys?

Digitized by Google

4. What is 50 per cent. of 4? 2 is 50 per cent. of what? 4 is 50 per cent. of what? 10 is 50 per cent. of what?

5. Make a problem, using the following numbers, and solve it: 12, 36, 3.

Lesson 125.

1. How many half-pints are there in 2 quarts?

2. The sum is 3962; one addend is 1596. What is the other?

3. I paid $300 for a horse, and one-eighth as much for hay. How much did I pay for both?

4. A cellar is 40 feet long, 20 feet wide, and 8 feet deep. How many square feet in the bottom? How many square feet in one of the largest sides?

5. I paid $52.50 for 10 weeks' board. How much was that per day?

Lesson 126.

1. Change 242 to thirds.

2. Take one-third of 3000 from one-thirtieth of 30,000.

3. If the remainder is 3960, and the subtrahend is 2140, what is the minuend?

4. A boy pulls beets at the rate of 1 cent for 4 dozen. How much does he get for pulling 1200 beets?

5. Make a problem whose numbers and operations are as follows, and solve it: $3972 \div 12 \times 842$.

Lesson 127.

1. If the number of square feet in a board is 30, and it is 15 feet long, how wide is it? Make a diagram illustrating your work.

Digitized by Google

2. $(396 + 497 - 242) \times 96 = ?$

3. Make a problem to suit the numbers given in the last question.

4. Add \$37.42, \$86.90, \$13, \$21.21, \$39.16.

5. From ten dollars subtract 10 cents.

Lesson 128.

1. I bought a horse for \$300, and sold him for 75 per cent. of what he cost me. How much did I lose?

2. What is one-seventeenth of 9376?

3. How many cubic feet of wood in a pile of wood 8 feet long, 4 feet high, and 4 feet wide?

4. How many square rods in a rectangular field 30 rods long and 15 rods wide?

5. About how many square rods are there in your school-room floor?

Lesson 129.

1. Draw a triangle whose sides are, respectively, 3, 4, and 5 inches.

2. Draw the three altitudes of the triangle.

3. Measure the lengths of these altitudes in inches and tenths of an inch.

4. Find the area of the triangle.

5. Make a problem, and solve it, to correspond to these numbers: $\frac{346+143}{8} = ?$

Lesson 130.

1. How many square inches in one face of a 2-inch cube?

2. How many square inches in the 6 faces of a 3-inch cube?

Digitized by Google

3. How many square inches in the two ends of a square prism that is 2 inches by 2 inches by 4 inches?

4. How many square inches in the top and bottom of this prism? How many in the two sides?

5. How many square inches in the entire surface of a square prism 3 inches by 3 inches by 6 inches?

Lesson 131.

1. How many feet in 3962 inches?
2. How many inches in 3962 feet?
3. How many yards in 3962 feet?
4. How many feet in 3962 yards?
5. How many feet in 30 rods?

Lesson 132.

1. Find the cost of 3.3 bushels of corn at $0.55 a bushel.

2. Measure the length and width of your school-room door, and find the number of square inches which it contains.

3. How many square inches make a square foot? Make a diagram to illustrate and explain your work.

4. How many square feet are there in the school-room door?

5. How many pounds are there in 560 ounces?

Lesson 133.

1. Add 3.36, 1.05, 4.6, 16, 16.66.
2. From 330 subtract .30.
3. What are the prime factors of 24? 27?

Digitized by Google

4. How many square feet are there in a walk 10 yards long and 1 yard wide?

5. How many square inches in a triangle whose base is 13 inches, and whose altitude is 16 inches?

Lesson 134.

1. How many cubic feet in a pile of wood 16 feet long 4 feet wide, and 8 feet high?

2. 128 cubic feet make a *cord*. How many cubic feet in 3 cords? How many cords in 256 cubic feet?

3. How many cords in the pile described in problem 1 of this lesson?

4. How many cords in the pile described in the third problem of Lesson 131?

5. Divide 10.50 by 1.3.

Lesson 135.

1. Find three sevenths of 924.

2. 324 is one seventh of what?

3. If I gave 25 per cent. of my money to 5 boys, paying 50 cents to each boy, how much money did I have?

4. Write 5 numbers divisible by 2. 5 others divisible by 5. 5 others divisible by 10.

5. Make a problem for these numbers: $(32 \times 5 + 6) \div 2 = ?$

Lesson 136.

1. If I have \$3.10, to how many boys can I give 10 cents each and have 50 cents left?

2. Find the area of a triangle whose base is 13 inches, and whose altitude is 18 inches.

Digitized by Google

3. Show, by a diagram, that any right triangle is one-half of a rectangle.

4. Show, by a diagram, that any triangle may be divided into two right triangles.*

5. Find the prime factors of the following: 10, 15, 20.

Lesson 137.

1. What is the least number which will contain 3, 2, and 5 without a remainder? Such a number is called the *least common multiple.*

2. What is the least common multiple of 4, 5, and 6?

3. What are the factors of 16?

4. If the divisor is 3.6, and the quotient is 3.9, what is the dividend?

5. If I buy cheese at 12 cents a pound with potatoes at 56 cents a bushel, how many bushels of potatoes shall I require in order to purchase 28 pounds of cheese?

Lesson 138.

1. I have a square pyramid whose base is 2 inches square, and whose slant height is 4 inches. How many square inches in the base?

2. What is the shape of one face of my pyramid? What is the length of its base? Of its altitude?

3. What is the area of one face of my pyramid? Of all the faces?

4. What is the area of the whole surface of my pyramid?

5. Make a problem whose numbers and operations are as follows: $(3\times 3+(\frac{3\times 5}{2}\times 4)=?$

*The teacher should draw a triangle on the board similar to the one she wishes the pupils to use. Or she may draw several triangles of different dimensions, and ask the pupils to select any one for a model.

Digitized by Google

Lesson 139.

1. A farmer's wife went to market with 5 dozen of eggs, 36 pounds of poultry, and 3 bushels of potatoes; she sold her eggs at 15 cents a dozen, her poultry at 14 cents a pound, and her potatoes at 50 cents a bushel; she bought with her money 5 pounds of coffee at 35 cents, 10 pounds of sugar at 7 cents, and 10 yards of cloth at 9 cents a yard. How much money had she left?

2. A boat goes down a stream at the rate of 10 miles an hour; she returns at the rate of 6 miles an hour. How long will it take her to travel 30 miles and return?

3. Three men can mow an acre in 3 hours. How long will it take 9 men to mow it? How long will it take 18 men to mow it?

4. How many dimes make 5 dollars?

5. A merchant bought cloth at 4 dollars a yard, and sold it at 5 dollars a yard. What per cent. did he gain?

Lesson 140.

1. How many minutes are there from 10.30 A.M. to 2.30 P.M.?

2. If 5 knives cost $1.25, what will 50 knives cost?

3. An express train travels 40 miles an hour, and a mail train travels 25 miles an hour. If both start from a station at the same time and go the same way, how far apart will they be at the end of 5 hours

4. What are the prime factors of 9? 12? 15? 18?

5. A earns $800 in a year; B earns 25 per cent. more than A; C earns 25 per cent. more than B. How much do all earn?

Digitized by Google

Lesson 141.

1. Dividend, 3262; quotient, 22; remainder, 46. Find the divisor.

2. Find the minuend when the subtrahend is $642.40, and the remainder is $560.29.

3. $\frac{1}{3}$ of 3963 is how much more or less than $\frac{1}{2}$ of 2644?

4. How many feet in 8 rods?

5. How many square feet in a right triangle whose legs are 50 feet and 75 feet, respectively?

Lesson 142.

1. If James saves $5 a month for this year, and 25 per cent. more next year, how much will he save in the two years?

2. A grocer bought a gallon of vinegar for 20 cents, and sold it at 5 cents a pint. How much did he gain?

3. What is the least common multiple of 4 and 6?

4. There are 540 square feet in the floor of a certain room; its width is 20 feet. What is its length?

5. What is the cost of 50 rods of barbed wire fence at 2 cents a foot?

Lesson 143.

1. I bought a house for $1320.50, and sold it so as to gain 10 per cent. For how much did I sell it?

2. Make a problem, and solve it, whose numbers and operations are indicated as follows:

$$\frac{324+462}{17} - \frac{180+140}{24} = ?$$

3. The distance from Boston to Chicago is 960 miles. If a train traveled at an average speed of 48 miles an hour, how long would it take for the trip?

Digitized by Google

4. A man gave a pint of peanuts to each of 500 children. How many bushels did he use?

5. A grocer had 320 pounds of coffee is his store, and 7 times as much sugar. How many pounds of both had he?

Lesson 144.

1. How many pints in 48 gills?
2. How many gills in 48 pints?
3. How many gallons in 48 gills?
4. How many gills in 48 gallons?
5. Make and solve a problem for the following statement: $(526 - 422) \times 5 + 3\,(6 - 2) = ?$

Lesson 145.

1. If a steamer burns 100 tons of coal in a day for 10 days, and her coal costs \$4.30 a ton, how much does the coal for her voyage cost her?
2. Find the sum of \$39.62, \$18.24, \$16.42, \$390.14, \$180.01, and \$11.11.
3. Find the cost of 39.2 bushels of corn at 31 cents a bushel.
4. The base of a triangle is 6 inches, and its altitude is 8.6 inches. What is its area?
5. The multiplier is 37, and the product is 897. What is the multiplicand?

Lesson 146.

1. Multiply 3.42 by 34.2.
2. Divide 3600 by 3.6.
3. The difference between two numbers is 396; the larger is 4396. What is the smaller?

Digitized by Google

4. What is the difference between one-seventh of 3143 and one-nineteenth of 8113?

5. At the rate of 3 for a cent, how much must be paid for 5 dozen apples?

Lesson 147.

1. A boy went to the store with 3 "halves," 2 "quarters," 4 dimes, 2 "nickels," and 5 cents. He spent \$0.37 for paper, \$0.25 for envelopes, \$0.05 for ink, and \$0.05 for pens; he then went to the post office and bought 10 2-cent stamps and 5 1-cent stamps. How much money did he have left?

2. I have a farm at a corner made by two roads; the distance along one road is 200 rods, the distance along the other is 200 rods, and the distance from one road to the other on the farm line is 240 rods. Wishing to know how large my farm is, I asked my neighbor how to compute it. He said I must first "get an altitude," if I wished to do my own surveying. I therefore took an altitude from the longest side, and found it to be 160 rods. Make a diagram to show how the farm looked, and put the dimensions in figures on the lines.

3. Find the number of square rods in the farm.

4. 160 square rods make an acre. How many acres in the farm?

5. Make a problem of which the following is a statement: $(\frac{360 \times 240}{2}) \div 160 = ?$

Lesson 148.

1. Find the prime factors of 30 and 35.

2. What is the least common multiple of 3, 4, 5, and 6?

Digitized by Google

3. Write five numbers divisible by both 2 and 5. By what other number are these numbers also divisible?

4. How many acres in 960 square rods?

5. How many square inches in two square yards?

Lesson 149.

PROBLEMS IN ACCOUNTING.

1. Find the cost of 31 pounds of coffee at 36 cents a pound, and 50 pounds of sugar at 6 cents a pound.

2. If the interest of $1 for 1 year is $0.06, what is the interest of $40 for 2 years?

3. I paid for 4 sheep at $3.50 each a 20-dollar bill. How much "change" did I receive?

4. If I divide $37.50 equally among 5 boys, how much does each boy receive?

5. What is the cost of $37\frac{1}{2}$ lbs. coffee at 40 cents a pound?

6. I exchange eggs at 14 cents a dozen for tea at 70 cents a pound. How many pounds can I buy with 25 dozen eggs?

7. I purchased 30 axes at $8 a dozen. How much did they cost me?

8. I earn $1500 a year; my expenses are $950. How much can I save in 10 years?

9. What is the cost of 72 marbles at the rate of 4 for a cent?

10. What must be paid for 4 weeks' board at $4.50 per week, and 4 weeks' washing at 50 cents a week?

11. I exchanged 30 pigeons at 15 cents each for chickens at 30 cents each. How many chickens did I receive?

Digitized by Google

12. I paid $50 for a carpet, $27 for a sofa, $42.27 for chairs, and $17 for a book-case. How much did I pay for all?

13. Find the cost of 300 shares of railroad stock at $110 a share.

14. I bought a horse for $300, and sold him so as to gain 25 per cent. What did I get for him?

15. A lady bought 22 yards of cloth at 15 cents a yard, 44 yards at 9 cents a yard, and 32 yards at 22 cents a yard. What did she pay for all?

16. Find the cost of 36 yoke of oxen at $125 a pair.

17. A gentleman's farm consists of 35 acres of tillage, worth $125 an acre; 300 acres of pasture, worth $15 an acre; and 150 acres of woodland, worth 20 an acre. What is the value of the whole farm?

18. A cheese factory shipped on one day cheeses weighing as follows: 30 lbs., 26 lbs., 41½ lbs., 36 lbs., 29½ lbs.; the price received was 8 cents a pound. What was the value of the day's shipment?

19. If 8 marbles can be bought for a cent, how many can be bought for a "quarter"?

20. I bought a carriage for $250, and sold it at a loss of $37.50. What did I get for it?

21. I sold a car-load of 320 bushels of potatoes at 36 cents a bushel; I expended the proceeds in flour at $3.75 a barrel. How many barrels did I buy?

22. I bought 10 shares of railroad stock at $160 a share, and sold it at a gain of 10 per cent. For how much did I sell it?

23. I went to town with $17.62 in my purse; I expended $10.11, and returned with $6.51. How much had I lost?

Digitized by Google

24. If the interest of $25 for 2 years is $3, what is the interest of $1 for 1 year?

25. If the interest of 1 dollar for 1 year is 5 cents, what is the interest of $240 for 6 years?

Lesson 150.

PROBLEMS IN PROFIT AND LOSS.

1. If I buy a horse for $175, and sell him for $200, what do I gain?

2. If I buy a farm for $1600, and sell it at a loss of $400, for how much do I sell it?

3. I sold a share of railroad stock for $1300, thereby gaining $250. What did the stock cost me?

4. I sold a house and lot for $3500, thereby losing $275. How much did I pay for the house?

5. If I buy land at $80 an acre, and sell it at a profit of 20 per cent., how much do I gain on 60 acres?

6. If A sells a store to B for $1500, B to C at a gain of 10 per cent., and C to D at a loss of 10 per cent., what does D pay for the store?

7. I sold 50 acres of land for $5000, at a loss of $15 per acre. How much did the land cost me?

8. James bought 30 marbles at 2 cents each; he sold them to Harry for $0.75. How much did he gain?

9. I have three horses that cost me $450. If I sell one for $200, another for $150, and the other for $125, how much do I gain?

10. I pay 56 cents a bushel for potatoes, and sell them at a profit of 25 per cent. At what price do I sell?

11. I bought a field of 10 acres for $1000; I sold 7 acres of it at $125 an acre, and the rest at $85 an acre. How much did I gain?

Digitized by Google

12. If there are 25 sticks of candy in a pound, and I sell it for a cent a stick, what do I make on a pound if it costs me 15 cents?

13. What is the per cent. of gain on goods bought for $30 and sold for $36?

14. I bought a horse for $300, and sold it so as to gain $\frac{1}{3}$ as much as the cost. What did I get for it?

15. What part of the cost is gained when goods are bought for $30 and sold for $33? What per cent. is gained?

16. I sold goods for $50 which cost me $40. What part of the cost did I gain? What per cent. did I gain?

17. I buy paper at 10 cents a pound, and sell it for 20 cents a pound. What part of the cost do I gain? What per cent. do I gain?

18. I sold two horses for $300; the buyer was not pleased with his bargain, and sold them for $240. What per cent. did he lose?

19. If James sells marbles for 10 cents which cost him 8 cents, what per cent. does he gain?

20. If I buy butter at 20 cents a pound, and sell it at a profit of 20 per cent., what do I receive for 100 pounds?

21. If 32 quarts of berries fill 40 "quart" boxes, what per cent. of increase does there seem to be?

22. I buy goods for $96, and sell for $87. What is my loss?

23. I sell goods for $96, thereby losing $14. How much did the goods cost me?

24. A florist sold 300 violets for 2 cents each, and 100 for $\frac{1}{2}$ a cent each; they all cost him 1 cent each. How much did he gain?

25. If I sell corn at 56 cents a bushel that cost me 63 cents, what part of the cost price do I lose?

Digitized by Google

Lesson 151.

PROBLEMS IN MENSURATION.

1. How many square inches in a square 2 inches on each side?

2. How many square feet in an oblong 5 feet by 15 feet? Illustrate by a diagram. How many rows of squares? How many squares in each row?

3. Find the area of a garden 50 yards long and 30 yards wide.

4. How many square rods in a field 40 rods wide and 60 rods long?

5. How long is an oblong whose width is 10 inches, and whose area is 120 square inches?

6. How wide is a rectangular flower-bed whose length is 10 feet, and whose area is 60 square feet?

7. I have a rectangular field that contains 320 square rods; its width is 16 rods. How long is it?

8. Draw a square 5 inches by 5 inches. Divide it into square inches. How many square inches in the rectangle?

9. Divide the rectangle constructed in problem 8 into two parts by a line drawn from one angle (corner) to the opposite angle. Into what two figures have you divided your square? What part of the square is each triangle? Prove by counting the squares. How will you always find the area of a right triangle?

10. What is the area of a right triangle that is 6 inches by 6 inches by $8\frac{1}{2}$ inches?

11. If I divide my rectangular flower-bed by a partition from one corner to an opposite corner, what is the shape of each part? Are the two parts equal in size?

Digitized by Google

12. If the flower-bed is 10 feet long and 4 feet wide, what is its area? What is the area of each half?

13. I have a triangular lot of land 30 feet by 40 feet by 50 feet; one corner is a square corner. How many square feet in the lot?

14. My largest field is at a corner formed by two roads; the field runs 150 rods on one road, and 250 rods on the other; the third side is 200 rods; one corner is a right angle. How many square rods in the field?

15. How many sides, or faces, has a cube? How do they compare in size?

16. How many square inches in one side of a 3-inch cube?

17. How does a square prism generally differ from a cube? Does it always differ from a cube? How many pairs of equal sides has a square prism?

18. In a square prism 6 inches by 4 inches by 4 inches, what is the area of the entire surface?

19. Draw a triangle whose sides shall be 5 inches, 6 inches, and 8 inches, respectively. Draw an altitude [see page 66] from the longest side. Measure its length in inches and tenths of an inch.

20. Find the area of the triangle described in problem 19.

21. How many faces has a square pyramid? Describe each. How many are just alike?

22. Find the area of the entire surface of a square pyramid whose base is 6 inches square, and whose slant height is 9 inches.

23. Describe a 1-inch cube. How many such cubes in a 2-inch cube? In a 3-inch cube?

24. How many 1-inch cubes in a square prism 3 inches by 3 inches by 6 inches?

Digitized by Google

25. How many squares $\frac{1}{2}$-inch each way in a rectangle 5 inches long and 3 inches wide?

Lesson 152.

PROBLEMS IN REDUCTION.

1. How many minutes in 6 hours?
2. How many hours in 600 minutes?
3. How many minutes in 5 hours and 20 minutes?
4. How many units in 3 dozen?
5. How many dozen in 48 units? In 50 units?
6. How many inches in 10 feet?
7. How many feet in 144 inches?
8. How many inches in 4 feet and 2 inches?
9. How many feet in 100 inches?
10. How many yards in 27 feet?
11. How many feet in 27 yards?
12. How many feet in 10 yards and 2 feet?
13. How many yards in 20 feet?
14. How many feet in 6 rods?
15. How many rods in 33 feet?
16. How many feet in 4 rods and 10 feet?
17. How many square inches in a square foot?
18. How many square feet in a square yard?
19. How many square feet in 120 square yards?
20. How many cubic feet in 5 cords of wood?
21. How many cubic inches in a cubic foot?
22. How many pounds in 300 ounces?
23. How many ounces in 300 pounds?
24. How many ounces in 10 pounds and 8 ounces?
25. How many pounds in 75 ounces?

Digitized by Google

Lesson 153.

PROBLEMS IN ARITHMETICAL PROCESSES.

1. Add 3624, 2493, 246, 75.

2. If the sum is 3962, and one of the two numbers added is 2462, what is the other?

3. Find the difference between 2462 and 4065.

4. If 2461 be taken from 5421, what is the remainder?

5. If the remainder is 42, and the minuend is 4262, what is the subtrahend?

6. 6424 is 2437 less than what number?

7. Find the product of 2781 and 426.

8. If the multiplier is 876, and the product is 3,715,992, what is the multiplicand?

9. Find the product of 391, 627, and 496.

10. The product of three factors is 209,664; two of the factors are 96 and 39. What is the other factor?

11. $3796 \div 42 = ?$ $\quad 141 \overline{)1896} \; ? \quad \frac{18,924}{18} = ?$

12. If the divisor is 96, and the quotient is 391, what is the dividend?

13. If the quotient is 876, and the dividend is 3,715,992, what is the divisor?

14. Add 37.6, 42.26, and 100.

15. From 396 take 200.44.

16. Find the product of 39.6, 24, and 37.9.

17. Divide 89.62 by 5.7.

18. Find one twentieth of 3962.

19. Find 3 fifteenths of 13,440.

20. 67 is one-half of what number?

21. $(29 + 46 - 1) \times 18 = ?$

Digitized by Google

22. $\frac{37-14}{23}+\frac{140-10}{13}=?$

23. $(39+10)\times 4-(37+42)=?$

24. $\frac{139-100}{13}=?$

25. $(42-4)\times 6+?=300.$

Lesson 154.

PROBLEMS IN THE PROPERTIES OF NUMBERS.

1. What numbers are divisible by 2? By 5? By 10?
2. Give three numbers divisible by 2. By 5. By 10.
3. Give three numbers divisible by 2, 5, and 10.
4. What are the factors of 4? 6? 8? 9? 10? 12?
5. What are the prime factors of 56?
6. Name five numbers of which 4 is a factor.
7. Of what number are 3, 2, and 5 the prime factors?
8. Name a multiple of 6. Of 7. Of 8.
9. Name a number which is a multiple of both 5 and 6.
10. Name two numbers that are multiples of 3 and 4.
11. What is the least number that is a multiple of both 4 and 6?
12. How many halves in 3 units? In 10 units?
13. How many thirds in 5 units? In 15 units?
14. How many fourths in 10 units? In 30 units?
15. How many eighths in 6 units? In 25 units?
16. In 14 halves how many wholes?
17. In 36 eighths how many wholes?
18. What part of 3 is 1? Of 3 is 2?

Digitized by Google

19. What part of $\frac{1}{2}$ is $\frac{1}{4}$?
20. What part of $\frac{1}{3}$ is $\frac{1}{6}$?
21. How many wholes in 100 tenths?
22. What part of 1 is 5 tenths?
23. What part of one is 10 per cent?
24. $\frac{1}{4}$ of anything is what per cent. of it?
25. What part of anything is 25 per cent of it?

Lesson 155.

LABOR AND TIME.

1. If 1 boy can shovel a path in 20 minutes, how long will it take 2 boys?

2. If 2 boys can distribute 200 hand bills in an hour, how long will it take 1 boy to do it?

3. If 5 men can do a piece of work in 1 day, how long will it take 1 man?

4. If 5 men can do a piece of work in 2 days, how long will it take 1 man?

5. If 1 man can do a piece of work in 6 days, long will it take 3 men?

6. If 5 men can do a piece of work in 4 days, how long will it take 2 men?

7. If a man can build a wall in 5 days, what part can he build in 1 day?

8. If 3 men can build a wharf in 4 days, what part of it can they build in 1 day?

9. If a man can build one-half of a wharf in 1 day, how long will it take him to build the whole?

10. A man who had a journey to make traveled one-third of the distance the first day. How long did it take him to make the journey?

Digitized by Google

11. A teacher corrected one-fourth of a set of papers in an hour. How long did it take her to correct the whole?

12. If 5 men can build a house in 30 days, what part of the house can they do in 1 day?

13. A can build a certain wall in 2 days; B can build it in 4 days. What part can A do in 1 day? What part can B do in 1 day? What part (how many fourths) can both do in a day?

14. If 5 men can build a house in 30 days, how long will it take 3 men to build the same house?

15. If 6 men can mow a field in 5 hours, how long will it take 9 men to mow the same field?

16. 2 boys did the family chores in one-half an hour. How long would it have taken 1 boy?

17. If 60 horses consume 450 bushels of oats in a month, how long would the same quantity last 40 horses?

18. A besieged garrison had rations for 40 days. How long would it last the same men on half rations?

19. A family has provisions for 8 people for 3 months. If 3 people leave the family, how long will the food last?

20. 2 pipes of the same size running into a cistern fill it in 3 hours. How long would it take 1 of the pipes to fill the cistern?

21. A family of 5 persons eat a barrel of flour in 3 months. How long will the barrel last 3 persons?

22. If a ten-pound box of butter will last a family of 6 people 2 weeks, how many people will it last 1 week?

23. If 6 men require 3 hours to mow a field, how many men will be needed to mow the same field in 1 hour?

24. If 8 men can build 42 rods of wall in 1 week, how many men will it require to build it in 3 weeks?

25. If a fort is garrisoned by 100 men, who have food

Digitized by Google

for 40 days, how many men must be sent away to have the food last 60 days?

Lesson 156.

PROBLEMS IN REDUCTION AND ACCOUNTING.

1. Find the cost of 5 yards of ribbon at 3 cents a foot.

2. I bought a bushel of blueberries for $3, and sold them for 10 cents a quart. What did I get for them? What did I gain?

3. If silver wire is worth 5 cents an inch, what will 6 feet cost?

4. At 10 cents a foot, what will 4 rods of rope cost?

5. If 1 ounce of gold is worth $10, what are 35 pounds worth?

6. At 1 cent an ounce, what will 3 pounds and 3 ounces of cheese cost?

7. Find the cost of 2 gallons of vinegar at 1 cent a gill.

8. If milk is worth 4 cents a pint, what are 4 gallons worth?

9. If molasses is sold at $0.64 a gallon, what is the cost of 1 gill?

10. If 5 yards of ribbon cost 75 cents, what is the cost of a foot?

11. If 3 pounds of butter cost 72 cents, what is the cost of 2 ounces?

12. What is the cost of a house-lot containing 500 square yards at 15 cents a square foot?

13. If land is worth 1 cent a square foot, what will 100 square feet cost?

14. At 25 cents a square foot, what will 20 square yards of cloth cost?

Digitized by Google

15. A triangular field has a base of 300 rods and an altitude of 290 rods. What is the value of the field at $1 a square rod?

16. I have a garden in the shape of a right triangle whose sides are 300, 400, and 500 feet, respectively. What is its value at 15 cents a square foot?

17. I have a triangular piece of gold plate worth 30 cents a square inch; the three sides of the piece measure 6 inches, 8 inches, and 10 inches. (Can you find an altitude?) What is the value of the plate?

18. What will it cost at 5 cents a square foot to cover a roof that is 18 feet by 20 feet?

19. What will it cost to plaster a ceiling 30 feet by 90 feet, at 6 cents a square yard?

20. One side of a triangular field is 30 rods; the perpendicular distance to the opposite corner is 16 rods. Find the cost of the field at $2.50 a square rod.

21. An oblong field is 6 rods long and 4 rods wide. What is its value at 6 cents a square foot?

22. What will it cost to lay a wall 100 feet long, 4 feet high, and 2 feet thick, at 50 cents a cubic foot?

23. Find the cost of digging a cellar 40 feet by 21 feet by 9 feet, at $0.75 a cubic yard.

24. If gold were worth $125 a cubic inch, what would be the value of a block 2 inches by 4 inches by 8 inches?

25. What is the value of a block of lignum vitæ 5 inches by 3 inches by 3 inches, at 2 cents a cubic inch?

Lesson 157.

MISCELLANEOUS PROBLEMS.

1. If a boat travels 6 miles an hour, how long will she be in going 24 miles?

Digitized by Google

2. I rode 37 miles by stage, 54 miles in a railroad train, and 3 miles in a street car. How far did I ride in all?

3. A railroad train travels 50 miles an hour. How far does it go in 5 hours?

4. Henry counted the apples in a peck, and found 97. At that rate, how many apples would there be in 300 pecks?

5. There are 144 pens in a box. How many pens in 60 boxes?

6. If I can buy 3 marbles for a cent, how many can I buy for 15 cents?

7. If there are 10 school-rooms in your building, and an average of 45 pupils in a room, how many pupils are there in your building?

8. Five little girls wore beads to school; one had 30, another 20, another 28, another 42, and another 46. How many beads had they all?

9. If there are 4 legs on every chair, and 3 chairs in every room, and 12 rooms in the building, how many chairs are there in all?

10. There are 4 pecks in 1 bushel. How many pecks are there in 50 bushels?

11. How many trees in an orchard of 25 rows of 21 trees each?

12. How many "week days" in 390 weeks?

13. How many weeks in 390 days?

14. How many units in 5 dozen?

15. How many dozen in 136 units?

16. How many hours in 120 minutes?

17. How many minutes in 30 hours?

18. How many units in 3 score?

19. How many score in 60 units?

Digitized by Google

20. If there are 196 school days in a year, how many complete school weeks are there?

Make and solve problems to correspond with the following numbers:

21. $(31 \times 26) \div 42$.

22. 326×14.

23. $(187 + 193) \times 18$.

24. $(18 \div 6) \times 5$.

25. $\frac{322 + 426}{4} + \frac{1862}{2} = ?$

Digitized by Google

Digitized by Google

ANNOUNCEMENT.

We have in press a new series of

HISTORICAL READERS

By HELEN M. CLEVELAND.

They give many of the most vivid, although sometimes more obscure scenes in American history.

Five books are projected: —

No. I. — THE PERIOD OF DISCOVERY.
No. II. — THE PERIOD OF SETTLEMENT.
No. III. — THE REVOLUTIONARY PERIOD.
No. IV. — THE CIVIL WAR.
No. V. — RECENT HISTORY.

The books will be printed in large, clear type, illustrated with a few but good pictures, attractively and substantially bound, and furnished at a low price.

CORRESPONDENCE SOLICITED.

GAY'S PROBLEM CARDS

These cards are put up in sets in a strong envelope, with full directions for use. The solution of the problems requires the use of all possible combinations of numbers expressed by **one figure.**

Sample set of six cards sent on receipt of 10 cents.

BENJ. H. SANBORN & CO.

BOSTON, U. S. A.

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google